

OBJECTIVE: To discover how the atmosphere can be divided into layers based on temperature & pressure changes at different heights, by making a graph.

DIRECTIONS:

1. Table 1 contains the average temperature readings at various altitudes in the Earth's atmosphere. Plot this data by creating a graph on graphing paper – use the altitude (Y axis) and temperature (X axis) **limits** to scale your graph appropriately (hint: you should not put 0°C at the any edge – see figure 6 pg. 480 in textbook), and connect adjacent points with lines. Be careful to plot the negative temperature numbers correctly. This profile provides a general picture of temperature at any given time and place; however, the actual temperature may deviate from the average values, particularly in the lower atmosphere. Next, label a second X axis scale, below temperature, as Pressure in millibars (mb) **from 0 mb (bottom left) to 1000 mb (bottom right)**. Draw a curved line that describes how atmospheric pressure (P) changes with altitude (see figure 4 pg. 479).
2. Draw a line at each boundary (pause), separating the graph into sections.
3. You should place eight words on your graph in the correct locations: **troposphere, tropopause, stratosphere, stratopause, mesosphere, mesopause, thermosphere and ozone layer**. Label the record heights from which Joseph Kittinger and Felix Baumgartner skydived from and the year in which each performed their jump (look up using internet).
4. Research and briefly describe some characteristics of each layer. What occurs there? What would it be like to be in a particular layer? Could we even survive in that location?

TABLE 1

Avg Temp. Readings at Various Altitudes

Altitude (km)	Temperature (°C)
0	15
5	-18
10	-49
12	-56
20	-56
25	-51
30	-46
35	-37
40	-22
45	-8
48	-2
52	-2
55	-7
60	-17
65	-33
70	-54
75	-65
80	-79
84	-86
92	-86
95	-81
100	-72

Questions:

1. What is the basis for dividing the atmosphere into four layers?

2. Does the temperature increase or decrease with altitude in the:

troposphere _____ stratosphere _____

mesosphere _____ thermosphere _____

3. What is the approximate height and temperature of the:

tropopause: _____ km _____ °C

stratopause: _____ km _____ °C

mesopause: _____ km _____ °C

thermopause: _____ km _____ °C

LT: _____ Name _____ Date/Pd _____

4. What can you do to help remember the order & temperature pattern of the layers / pauses? (mnemonic device, saying, story, etc.)